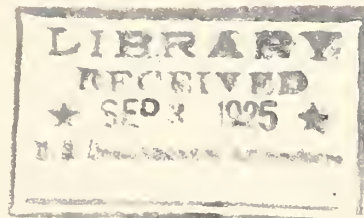


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REPORT OF PROGRESS IN BARBERRY ERADICATION FOR THE FISCAL
YEAR ENDING JUNE 30, 1925

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The campaign to remove all of the common barberry bushes in the 13 north-central grain-growing States has completed its seventh full year. Some preliminary publicity and survey was done in the spring of 1918, but the actual survey for barberries began July 1, 1918. On that date \$150,000, the first Federal appropriation specifically for barberry eradication, became available for the fiscal year 1919. The annual appropriation for each of the following three fiscal years, 1920, 1921, and 1922, was about \$150,000. For the fiscal year 1923, the amount of the appropriation was increased to \$350,000 and for the following fiscal year, 1924, a further increase to \$425,000 was made. Of the latter amount, however, \$125,000 became available only when an equal amount was furnished by the cooperating States and other agencies. For the fiscal year 1925, the amount of appropriation was \$300,000 plus a restricted item of \$111,315. This latter amount was matched by cooperating agencies making the total sum available from Federal sources, \$411,315.

The State agricultural colleges of the 13 States, the State departments of agriculture in most of the States, the Conference for the Prevention of Grain Rust, and similar allied agricultural and business organizations cooperated in the campaign. The work in each State is supervised by a State leader who makes contacts with the cooperating agencies, directs the field and publicity activities, supervises and coordinates the four phases of the campaign, namely, investigations, publicity, surveys, and eradication.

INVESTIGATIONS

The different lines of investigation were (1) stem-rust epidemiology studies, (2) classification of barberries and mahonias, (3) susceptibility of barberries and mahonias to stem rust, (4) chemical studies, and (5) observations in Kansas and Missouri.

Stem-Rust Epidemiology Studies

The Field agents in barberry eradication continued to cooperate in the stem-rust epidemiology studies. These studies were conducted in all of the States of the eradication area and in the other principal grain-growing States.

The following are some of the outstanding results: (1) The urediniospores of stem rust did not overwinter in the barberry eradication area; (2) aecio-spores developed on common barberries within the eradication area about a month previous to the appearance of stem rust on grains and grasses; (3) grains and grasses near infected barberries became rusted from two to three weeks before stem rust appeared on similar grains and grasses farther from the infected barberries; (4) in 1924 the severe stem-rust infection on spring wheat in central North Dakota was immediately traceable to about 80 barberry bushes near Jamestown, which had been overlooked in the original survey; (5) the occurrence of stem rust on oats over an area more than 60 miles long in western Wisconsin in 1924 was directly traceable to infected barberries in the area of escaped bushes near Trempealeau.

At the beginning of the campaign, before great numbers of barberries were removed it was nearly impossible to differentiate between the local stem-rust epidemics which the infected barberries caused. Now that so many millions of these bushes have been removed the local epidemics are greatly reduced in number and are much more easily distinguished. Within the last year it has been possible to find great numbers of barberry bushes by tracing stem-rust epidemics from areas of light infection to areas of heavier infection until the source of the epidemic was reached. It seems very probable that when the barberry population in the 13 States is reduced to such a minimum that each local epidemic can be clearly isolated from the other epidemics each common barberry eventually will reveal its location in a year favorable to the production and spread of stem rust.

Classification of Barberries and Mahonias

During the year numerous foreign and native species and strains of barberries and mahonias have been added to the Berberis garden at Bell, Maryland, which is continued in cooperation with the Office of Horticultural Investigations. These are being assembled for description and classification. Native species of barberries also are being studied in their natural habitat.

The American barberry, Berberis canadensis Miller, which was found along the Tippecanoe River in Indiana in 1923, also was found near Spring Lake not far from the Illinois River, in Tazewell County, Ill., in 1924.

Susceptibility of Barberries and Mahonias to Stem Rust

All species and strains of barberry and mahonia obtainable are being assembled and tested for susceptibility to infection by the various varieties and physiologic forms of black stem rust. The results obtained will determine which of the numerous varieties of barberries are immune and may be planted in the eradication area. These investigations are carried on at St. Paul, Minn., in cooperation with the Minnesota Agricultural Experiment Station.

Chemical Studies

The investigations begun in September, 1921, to determine the most satisfactory chemicals with which to kill the common barberry were discontinued at the end of the fiscal year 1925. Approximately 40 different chemicals were tested under laboratory and field conditions. It was demonstrated that common crushed rock salt and kerosene are, in every respect, the two most satisfactory chemicals with which to kill common barberry. The use of sodium arsenite, which for a time was recommended, was discontinued because of the danger of live-stock poisoning. Either salt or kerosene is 100 per cent effective if properly applied; the cost and application of either chemical are considerably cheaper than eradication by digging. The availability of both salt and kerosene makes them especially satisfactory.

Chemical studies also have been made of (1) the effects of sodium arsenite and the effects of salt when used to kill the common barberry; (2) the relation of seasonal storage of reserve food products in the different parts of the barberry plant to the time of year for effective treating with chemicals; (3) the sterilizing effects of salt on soil; and (4) analyses of barberry tissues for alkaloids and glucosides, with methods for their extraction.

Observations in Kansas and Missouri

In July and August, 1924, field agents made a thorough original survey of certain selected localities in 12 northern and northeastern counties of Missouri, and 9 northern counties of Kansas. The purpose of this survey was (1) to determine how widely and in what numbers common barberries are distributed in those counties; (2) to determine how abundantly the barberries were rusted; and (3) to determine if stem rust had spread from barberries to grains and grasses.

The counties selected were those adjacent to States of the barberry eradication area, or counties a little farther south in which exceptionally large acreages of small grain are grown. A few representative townships were surveyed in each county. In Kansas an average of 22 per cent, or an average of 764 square miles, of each county was surveyed and an average of 7 plantings, or 129 bushes, was found in each of these counties. In Missouri an average of 40 per cent, or an average of 575 square miles, was surveyed and an average of 8.4 plantings, or 105.4 bushes, was found in each county. In both Kansas and Missouri some barberries were found in every county in which survey was made.

The observations for stem rust on barberries necessarily were made after July 1, and most of the infection was dried up when examined by the field men. In Missouri aecial infection was found on 129 barberry bushes in nine counties distributed rather generally over the northern part of the State. Owing to the late date of survey only one instance of stem-rust infection on grains and grasses was directly traceable to infected barberries. This was at Ridgeway, in Harrison County.

In Kansas 47 rural and 17 city properties having barberries were located. The bushes on 16 of the rural properties were quite heavily rusted. The survey in Kansas was not started until August 1, and it was not possible at that time to determine if the infected barberries had been instrumental in the spread of stem rust. Farmers in many cases did not know that barberry bushes were capable of spreading stem rust and could give very little information on this point. However, they did report severe stem-rust infections in past years on grains which were near barberry bushes.

PUBLICITY

Barberry eradication has been especially emphasized in the schools during the fiscal year. With the cooperation of Smith-Hughes instructors and school superintendents and teachers, many school children have been taught to identify the harmless Japanese barberry, the harmful common barberry, and the different stages of black stem rust.

Since the beginning of the eradication campaign about 1,825,000 copies of bulletins, circulars, and posters of the United States Department of Agriculture have been distributed in the 13 States. About 225,000 were distributed this year. The cooperating commercial agency, the Conference for the Prevention of Grain Rust, has printed and distributed over two million copies of bulletins, circulars, and posters since its organization in 1921. Publicity material also has been put out by the State departments of agriculture, and the Extension Divisions of the State colleges of agriculture have cooperated in printing and distributing educational literature. One or more State bulletins on barberry eradication have been printed and distributed on State funds by each of the States in the eradication area.

Circular letters were sent to all property owners in each of the counties to be covered by the farm-to-farm survey before the survey was started. This was done so that every property owner would have definite knowledge of the purpose of the campaign before the field assistants visited his premises.

SURVEYS

Types of Surveys

Survey activities are divided into three phases, namely, original survey, second survey, and resurvey.

The original survey is a property-by-property survey in cities, towns, and villages and a farm-by-farm survey in the country. During the year the original farm-to-farm and city survey was completed in Colorado, Indiana, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin. The original survey is very largely completed in Illinois, Michigan, Montana, and Ohio. The survey in Wyoming was finished in 1925. Only about 103 counties out of 895 remain to be covered by original survey.

A second survey now means a second complete original survey of every foot of every rural and city property on which barberries may possibly be growing. A second survey is necessary to locate bushes, escaped bushes, and seedlings which were missed on the original survey. The larger number of bushes found on second survey were those that had been cut down by property owners previous to the original survey and had grown again. It apparently will be necessary to cover by second survey all of the counties in which fruiting bushes have been found. Second survey results indicate that every wood lot, tree claim, and grove must be scouted foot by foot to insure finding every barberry bush. The second complete survey was conducted in 60.5 counties during the year. In all, 115.5 counties have been covered by the second survey.

A resurvey is a revisit to the properties on which barberries have previously been found and eradicated. Two years after the bushes are eradicated the properties are reinspected and sprouts and seedlings are removed to prevent the possibility of their becoming infected and starting anew the stem-rust epidemics. These resurveys have been combined with the second survey whenever practicable.

The Use of Government-owned Trucks on Surveys

City and town properties are surveyed on foot and there is very little necessity for the use of automobiles or trucks in city surveys except to transport field men between small towns where train services are poor. Motor vehicles are used in surveying rural properties because of the distances to be traveled and the necessity of carrying shovels and chemicals with which to eradicate barberries.

In order to reduce transportation costs to a minimum, the Office of Cereal Investigations purchased 52 light trucks in 1923. These can be owned and operated somewhat more cheaply than they can be rented and operated. The greatest disadvantage of Government-owned trucks is the depreciation and storage cost throughout the winter months. Table No. 13 gives a summary of the operation costs of 20 Government-owned trucks which were used for two years and then traded in as part payment for new trucks.

Barberry eradication is essentially a seasonal project and the maximum number of men are employed in June, July, and August. During these months automobiles are rented; it is more economical to do this than to purchase the necessary number of trucks for such a short period.

ERADICATION

Methods of Eradication

Although salt and kerosene are very satisfactory as killers for barberries their use has not entirely replaced digging. When the barberry bush is close to valuable plants or trees it is dug or pulled because of the possibility of damaging the other plants by an application of chemicals. Many seedlings and small escaped bushes are not treated since the entire root system can be pulled easily.

On original survey and second survey during the fiscal year 1925, 240,832 bushes were treated and 145,582 dug. The ease with which seedlings are pulled made it necessary to treat only 94,158 seedlings of the 671,772 destroyed on these surveys. On resurvey during the year, 14,636 sprouting bushes out of a total of 21,092, and 78,302 seedlings in 131,393 were treated. The percentage of treated seedlings on resurvey is higher than on original survey, because by the time of resurvey the missed seedlings have grown to a size where they can not well be pulled. During the fiscal year 304.5 tons of salt and 11,957 gallons of kerosene were used to kill 427,914 barberry bushes, sprouting bushes, and seedlings on 2,651 properties.

Escaped bushes

A determined effort has been made during the fiscal year to discover and treat all escaped barberries. One of the outstanding discoveries of the year's work is that areas of escaped bushes in nearly every instance are larger than was at first supposed. It has been necessary to survey several miles in every direction from hedges of fruiting barberries. Where the escaped bushes also are fruiting the method is to survey foot by foot at least two miles beyond the limit of the last fruiting escaped bush. Seedlings continue to appear every spring near the sites of hedges destroyed several years before, indicating that seeds lying on the surface of the ground retain their viability as long as six or seven years. A total of 3,860,402 escaped bushes and 4,631,929 seedlings has been found to date. Of these, 259,733 escaped bushes and 806,451 seedlings have been found this year.

SUMMARY

During the fiscal year approximately 124 counties were covered in the original survey, approximately 60 were surveyed a second time, and the equivalent of 220 counties was covered in resurvey. On original survey 294,760 bushes were found on 5,523 properties and 386,414 bushes were eradicated from 6,443 properties. These figures include 5,327 bushes on 779 properties found in the second survey. On resurveys, 21,058 sprouting bushes were found and 21,092 were eradicated. Seedlings numbering 806,451 were found on original, second survey, and resurvey. This makes a grand total for the fiscal year of 1,122,269 bushes, seedlings, and sprouting bushes and 1,210,671 destroyed. The grand total of bushes, sprouting bushes, and seedlings found during the entire campaign is 11,277,387. Of these, 10,679,692 have been destroyed.

ORIGINAL SURVEY, PROPERTIES, JULY 1, 1924, to JUNE 30, 1925

Table 1. Data showing, by States, the number of properties on which barberry bushes were found and destroyed in all surveys, and the number of properties upon which seedlings were found and destroyed in original and second surveys during the fiscal year July 1, 1924, to June 30, 1925

State	Number of counties covered in original survey	Number of properties on which bushes were found--			Total number of proper- ties cleared of bushes			Number of properties on which seedlings were--		
		In country		Total in:	Treated		Total	Found		Destroyed
		In cities: and towns:	Having escaped:	cities and country	Dug			Dug	Treated	Total
Colorado	0	3	4	11	14	3	9	12	0	0
Illinois	18.85	1,003	215	687	1,690	1,507	475	1,982	67	0
Indiana	22.00	149	86	173	327	178	177	355	10	14
Iowa	7.00	53	90	216	269	102	171	273	4	15
Michigan	21.40	262	262	539	801	891	304	1,195	13	14
Minnesota	0	37	40	132	169	64	105	169	142	8
Montana	8.27	26	6	23	49	32	16	48	7	14
Nebraska	0	20	21	78	98	25	74	99	1	0
North Dakota	4.00	12	0	25	37	9	28	37	3	4
Ohio	13.35	931	214	650	1,581	1,440	313	1,753	0	0
South Dakota	2.00	42	2	32	74	22	63	85	41	41
Wisconsin	22.00	189	121	230	419	283	152	435	0	1
Wyoming	0	0	0	0	0	0	0	0	21	14
Total	123.87	2,727	1,061	2,801	5,523	4,556	1,887	6,443	241	125
									374	366

ORIGINAL SURVEY, BUSHES AND SEEDLINGS, JULY 1, 1924, TO JUNE 30, 1925

Table 2. Data showing, by States, the number of barberry bushes found and destroyed in all surveys, and the number of seedlings found and destroyed in original and second surveys during the fiscal year July 1, 1924, to June 30, 1925

State	Number of bushes found--				Number of bushes destroyed			Number of seedlings				
	In cities and towns		In country		Total	Dug	Treated	Total	Found	Dug	Treated	Total
	Escaped	Total	Escaped	Total								
Colorado	11	107	173	184	184	55	118	173	0	0	0	0
Illinois	7,260	76,829	84,466	91,726	91,726	23,530	80,328	103,858	12,212	8,808	3,404	12,212
Indiana	731	48,757	49,482	50,213	50,213	621	76,684	77,305	7,346	159	7,187	7,346
Iowa	434	3,152	4,485	4,969	4,969	1,535	3,525	5,060	841	144	697	841
Michigan	1,332	115,228	116,601	117,933	117,933	65,866	64,951	130,817	600,050	562,422	37,628	600,050
Minnesota	287	1,159	1,777	2,064	2,064	346	1,718	2,064	649	299	350	649
Montana	129	135	240	369	369	750	261	1,011	167	167	0	167
Nebraska	147	282	750	897	897	220	664	884	1,077	525	552	1,077
North Dakota	36	0	302	338	338	31	307	338	0	0	0	0
Ohio	6,653	7,492	10,622	17,275	17,275	11,389	8,372	19,761	37,955	0	37,955	37,955
South Dakota	538	5	363	906	906	410	883	1,293	70	0	70	70
Wisconsin	739	6,537	7,097	7,836	7,836	40,829	3,021	43,850	14,691	5,090	6,315	11,405
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	18,397	259,733	276,363	294,760	294,760	145,582	240,832	386,414	675,058	577,614	94,158	671,772

ORIGINAL SURVEY, PROPERTIES, APRIL 1, 1913, TO JUNE 30, 1925

Table 3. Data showing, by States, the number of properties on which barberry bushes were found and destroyed in all surveys, and the numbers of properties upon which seedlings were found and destroyed in original and second surveys, April 1, 1913, to June 30, 1925

State	Number of counties covered by original survey	Number of properties on which bushes were found--			Total number of proper- ties cleared of bushes: which seedlings were--			Number of properties on		
		In country		Total in:	Treated		Found	Destroyed		
		In cities: and towns:	Having escaped:	cities and country	Dug	Total	Total	Dug	Treated	
Colorado	31.49	1,546	59	1,605	1,646	61	1,707	0	0	0
Illinois	46.25	10,080	997	11,077	11,471	1,168	12,639	135	95	135
Indiana	92.00	3,582	315	3,897	4,361	391	4,752	40	19	40
Iowa	99.00	7,011	691	7,702	8,967	610	9,577	44	23	44
Michigan	52.40	5,045	1,565	6,610	8,904	627	9,531	382	335	382
Minnesota	85.33	3,146	457	3,603	4,865	171	5,036	364	345	364
Montana	22.59	196	10	206	242	26	268	2	1	2
Nebraska	92.50	3,191	90	3,281	3,653	217	3,870	18	4	18
North Dakota	53.00	523	1	524	754	85	839	2	1	2
Ohio	69.10	7,487	437	7,924	9,148	486	9,634	55	12	55
South Dakota	69.00	438	108	546	794	247	1,041	83	81	83
Wisconsin	71.00	6,901	1,047	7,948	8,752	772	9,524	130	50	115
Wyoming	8.00	74	1	75	84	1	85	0	0	0
Total	791.66	49,270	5,778	55,048	63,641	4,862	68,503	1,260	966	279
				69,404						1,245

ORIGINAL SURVEY, BUSHES AND SEEDLINGS, APRIL 1, 1918, TO JUNE 30, 1925

Table 4. Data showing, by States, the number of barberry bushes found and destroyed in all surveys, and the numbers of seedlings found and destroyed in original and second surveys, April 1, 1918, to June 30, 1925

States	Number of bushes found--			Number of bushes destroyed			Number of seedlings--		
	In cities and towns	In country	Total	Dug	Treated	Total	Found	Dug	Destroyed
Colorado	19,597	2,653	4,311	24,408	23,884	512	24,396	0	0
Illinois	108,996	127,729	167,453	276,449	169,969	106,480	276,449	1,530,660	1,530,660
Indiana	77,393	103,703	118,596	195,989	97,718	97,366	195,084	8,040	7,285
Iowa	649,292	58,316	142,831	792,125	773,129	18,990	792,119	3,221	2,491
Michigan	53,832	345,476	414,841	468,673	365,990	79,442	445,432	783,148	783,148
Minnesota	592,447	81,317	192,052	784,499	780,266	4,233	784,499	20,309	20,309
Montana	6,905	883	3,315	10,220	9,562	644	10,206	812	812
Nebraska	73,081	5,717	21,309	94,390	90,467	3,887	94,354	7,245	7,245
N. Dakota	14,404	150	7,757	22,161	19,369	2,592	22,161	156	156
Ohio	215,497	32,111	48,343	263,840	241,395	18,257	259,652	38,791	38,791
S. Dakota	23,668	20,727	35,645	59,313	48,800	10,513	59,313	17,288	17,288
Wisconsin	280,658	3,081	619,3	3,373,945	2,844,817	19,219	2,864,036	35,139	26,953
Wyoming	3,946	1	196	4,142	3,966	2	3,966	0	0
Total	2,119,716	3,860,402	4,250,436	6,370,152	5,469,532	362,137	5,831,669	2,444,779	2,436,593

SECOND SURVEY, PROPERTIES, JULY 1, 1924, TO JUNE 30, 1925

Table 5. Data showing, by States, the number of properties on which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of counties surveyed	Number of properties on which bushes were found--		In cities: and towns:	Escaped: bushes:	Total found:	Total cleared:	Total found:	Dug and treated:	Dug and treated:	Total found:	Dug and treated:
		In country	Total									
Colorado	3.50	0	2	2	0	0	2	0	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0	0
Indiana	.15	68	2	70	0	69	1	70	1	1	0	1
Iowa	4.00	10	81	91	46	25	66	91	12	11	12	12
Michigan	3.00	49	75	124	38	78	46	124	4	0	4	4
Minnesota	12.00	28	125	151	36	49	102	151	18	14	18	18
Montana	6.00	0	1	1	0	1	0	1	0	0	0	0
Nebraska	9.50	19	80	99	21	27	74	101	7	3	4	7
N. Dakota	10.95	7	21	28	0	7	21	28	0	0	0	0
Ohio	2.00	18	7	25	0	24	1	25	0	0	0	0
S. Dakota	6.73	21	16	37	0	8	29	37	0	0	0	0
Wisconsin	2.60	57	94	151	50	83	68	151	11	5	6	11
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	60.43	277	502	779	191	371	410	781	53	18	35	53

SECOND SURVEY, BUSHES AND SEEDLINGS, JULY 1, 1924, TO JUNE 30, 1925

Table 6. Data showing, by States, the number of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of bushes found--			Number of bushes destroyed:			Number of seedlings--			
	In cities and towns:	In country:	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	0	2	2	0	2	2	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0
Indiana	253	7	260	261	1	262	3	3	0	3
Iowa	83	775	858	139	669	858	522	30	492	522
Michigan	96	438	534	262	272	534	240	240	0	240
Minnesota	200	967	1,167	243	924	1,167	618	268	380	618
Montana	0	1	1	1	0	1	0	0	0	0
Nebraska	146	776	922	434	664	1,098	1,077	525	552	1,077
North Dakota	27	276	303	28	275	303	0	0	0	0
Ohio	59	31	90	88	2	90	0	0	0	0
South Dakota	56	149	205	16	189	205	0	0	0	0
Wisconsin	209	776	985	180	805	985	6,789	3,269	3,520	6,789
Wyoming	0	0	0	0	0	0	0	0	0	0
Total	1,129	4,198	5,327	1,702	3,303	5,505	9,249	4,335	4,914	9,249

SECOND SURVEY, PROPERTIES, JANUARY 1, 1922, TO JUNE 30, 1925

Table 7. Data showing, by States, the number of properties on which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to June 30, 1925

State	Number of counties surveyed	Number of properties on which bushes were found--			Total number of proper- ties cleared of bushes			Number of properties on which seedlings were--		
		In country	In cities and towns:	Total	Having escaped:	Dug	Treated	Found	Dag	Destroyed
			Total	in cities and country						
Colorado	15.69	0	27	27	15	3	24	27	0	0
Illinois	0	0	0	0	0	0	0	0	0	0
Indiana	4.15	95	22	117	2	98	18	116	1	0
Iowa	6.00	12	110	122	62	31	90	121	13	12
Michigan	3.00	49	75	124	38	78	46	124	4	0
Minnesota	30.00	50	200	250	46	127	123	250	6	15
Montana	6.00	0	1	1	0	1	0	1	0	0
Nebraska	15.00	45	128	173	28	47	124	171	3	8
North Dakota	20.45	10	52	62	0	12	50	62	0	1
Ohio	2.00	13	7	25	0	24	1	25	0	0
South Dakota	9.97	27	29	56	0	8	43	56	1	0
Wisconsin	3.40	61	122	183	69	92	91	183	7	6
Wyoming	0	0	0	0	0	0	0	0	0	0
Total	115.66	367	773	1,140	260	521	615	1,136	23	42
								65		65

SECOND SURVEY, BUSHES AND SEEDLINGS, JANUARY 1, 1922, TO JUNE 30, 1925

Table 8. Data showing, by States, the number of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to June 30, 1925

State	Number of bushes found--			Number of bushes destroyed			Number of seedlings--		
	In cities and towns	In country	Escaped	Total	Dug	Treated	Total	Found	Destroyed
									Dug : Treated : Total
Colorado	0	43		75	6	69	75	0	0
Illinois	0	0		0	0	0	0	0	0
Indiana	305	15		397	324	70	394	3	0
Iowa	85	497		995	198	879	1,077	547	517
Michigan	96	339		435	262	272	534	240	0
Minnesota	313	778		2,441	1,472	1,237	2,759	711	411
Montana	0	0		1	1	0	1	0	0
Nebraska	463	376		1,796	560	1,637	2,247	1,495	970
North Dakota	64	0		1,367	64	1,367	1,431	3	3
Ohio	59	0		31	83	2	90	0	0
South Dakota	266	0		819	44	1,041	1,085	400	0
Wisconsin	214	753		897	211	900	1,111	7,159	3,520
Wyoming	0	0		0	0	0	0	0	0
Total	1,875	2,306		8,952	3,230	7,574	10,804	10,538	5,421
									10,538 : 5,421 : 10,538

RESURVEY, PROPERTIES, JULY 1, 1924, TO JUNE 30, 1925

Table 9. Data showing, by States, the number of properties on which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of properties on which sprout- ing bushes were found--										Total number of properties : Number of properties on which seedlings were--			
	: In country					: Total in : : cities and : : country :					: cleared of sprouting bushes :			
	: In cities, towns, and villages :	: Having escaped bushes :	: Total :	: cities and country :	: Total in : : cities and : : country :	: Dug :	: Treated :	: Total :	: Found :	: Dug :	: Treated :	: Total :	: Destroyed :	
Colorado	31	24	32	63	1	62	63	39	1	38	39	39	39	
Illinois	94	65	154	248	120	128	248	59	36	3	59	59	59	
Indiana	7	9	10	17	7	10	17	6	0	6	6	6	6	
Iowa	46	33	290	336	138	198	336	76	43	28	76	76	76	
Michigan	26	15	26	52	39	13	52	19	18	1	19	19	19	
Minnesota	25	54	124	149	69	80	149	58	25	33	58	58	58	
Montana	16	1	10	26	19	8	27	8	3	0	8	8	8	
Nebreska	9	1	19	28	11	16	27	5	4	1	5	5	5	
North Dakota	23	0	36	64	14	50	64	1	0	1	1	1	1	
Ohio	443	43	262	705	659	46	705	172	165	7	172	172	172	
South Dakota	29	14	47	76	8	68	76	22	2	20	22	22	22	
Wisconsin	50	72	141	191	101	91	192	62	42	20	62	62	62	
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	804	381	1,151	1,955	1,186	770	1,956	527	369	158	527	527	527	

RESURVEY, SPROUTING BUSHES AND SEEDLINGS, JULY 1, 1924, TO JUNE 30, 1925

Table 10. Data showing, by States, the number of sprouting bushes and seedlings found and destroyed on resurvey in barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of sprouting bushes found--				Number of sprouting bushes : destroyed				Number of seedlings--			
	In cities : and towns:		In country		Total		Dug		Total		Found	
	Escaped:	Total	Escaped:	Total	Total	Treated	Dug	Treated	Total	Dug	Treated	Total
Colorado	82	282	426	508	790	494	14	508	712	3	709	712
Illinois	923	533	2,984	3,907	3,907	2,864	1,043	3,907	31,650	29,895	1,755	31,650
Indiana	14	46	48	62	62	43	14	62	195	0	195	195
Iowa	205	1,050	3,114	3,319	3,316	2,621	695	3,316	4,291	2,678	1,613	4,291
Michigan	126	101	142	263	263	134	134	263	65,686	5,686	60,000	65,686
Minnesota	156	642	1,148	1,304	1,304	991	313	1,304	6,620	357	6,263	6,620
Montana	111	3	312	423	443	62	381	443	265	265	0	265
Nebraska	18	25	121	139	156	102	54	156	130	128	2	130
North Dakota	127	0	722	849	849	804	45	849	1	0	1	1
Ohio	2,047	528	1,444	3,491	3,491	647	2,844	3,491	12,513	10,393	2,120	12,513
South Dakota	270	63	205	475	475	465	10	475	651	224	427	651
Wisconsin	165	5,511	6,148	6,313	6,313	5,404	909	6,313	8,679	3,462	5,217	8,679
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,244	8,784	16,814	21,058	21,092	14,636	6,456	21,092	131,393	53,091	78,302	131,393

RESURVEY, PROPERTIES, APRIL 1, 1918, TO JUNE 30, 1925

Table 11. Data showing, by States, the number of properties on which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to June 30, 1925

State	Number of properties on which sprouting bushes were found--			Total number of properties : cleared of sprouting bushes:			Number of properties on which seedlings were--		
	In cities and towns:	In country:	Total in cities and country	Dug	Treated	Total	Found	Dug	Destroyed
	Having: escaped: bushes:								
Colorado	1,426	96	1,591	1,411	179	1,590	85	17	68
Illinois	338	290	932	406	526	932	248	200	48
Indiana	152	108	356	248	104	352	31	3	28
Iowa	284	210	1,019	588	431	1,019	153	93	60
Michigan	136	112	422	367	55	422	188	184	4
Minnesota	693	519	1,790	1,529	261	1,790	2,168	2,067	101
Montana	109	1	155	147	8	155	9	8	1
Nebraska	191	15	523	332	189	521	26	12	14
North Dakota	211	0	360	223	137	360	1	0	1
Ohio	1,045	137	1,662	1,567	95	1,662	303	257	46
South Dakota	339	33	664	510	154	664	65	23	42
Wisconsin	870	556	1,654	1,277	366	1,643	174	106	67
Wyoming	21	0	26	18	4	22	6	6	0
Total	5,815	2,077	11,154	8,623	2,509	11,132	3,457	2,976	480
									3,456

RESURVEY, SPROUTING BUSHES AND SEEDLINGS, APRIL 1, 1918, TO JUNE 30, 1925

Table 12. Data showing, by States, the number of sprouting bushes and seedlings found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to June 30, 1925

State	Number of sprouting bushes found--				Number of sprouting bushes destroyed				Number of seedlings--			
	In cities and towns:		In country:		Total		Total		Found		Destroyed	
	Escaped	Total	Escaped	Total	Dug	Treated	Total	Dug	Treated	Total	Dug	Treated
Colorado	3,780	1,933	3,031	6,811	5,136	1,674	6,810	2,535	707	1,828	2,535	1,328
Illinois	4,199	3,943	9,020	13,219	5,604	7,615	13,219	63,452	47,801	15,651	63,452	15,651
Indiana	1,482	16,685	18,040	19,522	17,447	1,770	19,217	3,457	255	3,202	3,457	3,202
Iowa	3,544	5,992	15,174	18,718	9,856	8,510	18,366	32,433	26,581	5,852	32,433	5,852
Michigan	511	1,169	2,391	2,902	2,206	696	2,902	607,261	547,176	60,085	607,261	60,085
Minnesota	13,898	14,969	33,703	47,601	40,120	7,481	47,601	25,191	2,494	22,697	25,191	22,697
Montana	3,476	3	1,610	5,086	5,024	62	5,086	910	265	545	910	545
Nebraska	5,972	82	9,552	15,524	12,389	3,132	15,521	2,652	976	1,676	2,652	1,676
North Dakota	364	0	840	1,204	196	1,008	1,204	1	0	1	1	1
Ohio	4,426	6,589	9,075	13,501	10,861	2,640	13,501	252,473	69,603	182,870	252,473	182,870
South Dakota	20,978	5,282	22,002	42,980	36,615	6,365	42,980	8,996	6,393	2,603	8,996	2,603
Wisconsin	11,111	73,078	76,748	87,859	19,167	68,385	87,552	1,187,737	61,318	1,076,419	1,137,737	1,076,419
Wyoming	356	0	23	379	305	16	321	52	52	0	52	0
Total	74,097	129,725	201,209	275,306	164,926	109,354	274,280	2,187,150	763,621	1,373,529	2,137,150	1,373,529

CHEMICAL TREATMENT, JULY 1, 1924, TO JUNE 30, 1925

Table 13. Data showing, by States, the number of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals, and the number of bushes, sprouting bushes, and seedlings treated from July 1, 1924, to June 30, 1925

State	Number treated--											
	With salt			With sodium arsenite			With kerosene			Total		
	Proper- ties	Bushes	Seed- lings	Proper- ties	Bushes	Seed- lings	Proper- ties	Bushes	Seed- lings	Proper- ties	Bushes	Seed- lings
Colorado	70	566	709	0	0	0	1	46	0	71	612	709
Illinois	592	82,009	5,159	6	14	0	5	1,169	0	603	83,192	5,159
Indiana	187	76,732	7,382	0	0	0	0	0	0	187	76,732	7,382
Iowa	355	5,985	2,307	0	0	0	14	161	3	369	6,146	2,310
Michigan	186	4,180	0	0	0	0	131	60,905	97,628	317	65,085	97,628
Minnesota	185	2,709	6,613	0	0	0	0	0	0	185	2,709	6,613
Montana	24	323	0	0	0	0	0	0	0	24	323	0
Nebraska	43	336	0	0	0	0	47	430	554	90	766	554
N. Dakota	78	1,111	1	0	0	0	0	0	0	78	1,111	1
Ohio	327	8,859	40,075	0	0	0	32	160	0	359	9,019	40,075
S. Dakota	124	1,338	481	0	0	0	7	10	16	131	1,348	497
Wisconsin	243	8,425	11,532	0	0	0	0	0	0	243	8,425	11,532
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,414	192,573	74,259	6	14	0	237	62,881	98,201	2,657	255,468	172,460

CHEMICAL TREATMENT, APRIL 1, 1913, TO JUNE 30, 1925

Table 14. Data showing, by States, the number of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals, and the number of bushes, sprouting bushes, and seedlings treated from April 1, 1913, to June 30, 1925

State	Number treated--										Total	
	With salt			With sodium arsenite			With kerosene					
	Prop- erties	Bushes	Seed- lings	Proper- ties	Bushes	Seed- lings	Proper- ties	Bushes	Seed- lings	Proper- ties	Bushes	Seed- lings
Colorado	239	2,140	1,828	0	0	0	1	46	0	240	2,186	1,828
Illinois	1,655	112,087	1,529,339	34	839	0	5	1,169	0	1,694	114,095	1,529,339
Indiana	495	99,136	10,487	0	0	0	0	0	0	495	99,136	10,487
Iowa	1,024	27,229	8,340	0	0	0	17	271	3	1,041	27,500	8,343
Michigan	312	10,639	3,000	259	8,594	29,911	131	60,905	97,628	682	80,138	130,539
Minnesota	405	11,604	23,290	25	85	102	2	25	30	432	11,714	23,422
Montana	34	706	1,290	0	0	0	0	0	0	34	706	1,290
Nebraska	359	6,589	7,442	0	0	0	47	430	554	406	7,019	7,996
N. Dakota	201	3,533	7	21	67	0	0	0	0	222	3,600	7
Ohio	405	11,964	111,135	10	1,069	59,300	166	7,864	50,950	581	20,897	221,385
S. Dakota	394	16,863	3,266	0	0	0	7	10	16	401	16,873	3,282
Wisconsin	787	81,779	1,091,404	350	5,824	1,702	a	a	0	1,138	87,604	1,093,106
Wyoming	5	18	0	0	0	0	0	0	0	5	18	0
Total	6,315	384,292	2,790,828	679	16,478	91,015	377	70,721	149,181	7,371	471,491	3,031,024

a Carbon bisulphide

CHEMICALS, QUANTITIES USED, JULY 1, 1924, TO JUNE 30, 1925

Table 15. Data showing, by States, quantities of chemicals used in the barberry eradication campaign from July 1, 1924, to June 30, 1925

State	Salt (tons)			Sodium arsenite (Gallons)			Kerosene (Gallons)		
	Furnished by--			Furnished by--			Furnished by--		
	Property: State	Conference: U.S.D.A.	Total	Conference: U.S.D.A.	Total	Owner	U.S.D.A.	Total	Total
	owner	agency: P. G. Rust:		P. G. Rust:					
Colorado	0	0	0.810	0	0	0	30.00	30.00	30.00
Illinois	.650	5.170	121.518	0	27	0	124.00	124.00	124.00
Indiana	.723	0	31.276	0	0	0	0	0	0
Iowa	6.854	0	17.643	0	0	224.75	0	224.75	224.75
Michigan	.030	0	19.844	0	0	0	10,811.00	10,811.00	10,811.00
Minnesota	.176	.636	4.122	0	0	0	0	0	0
Montana	.125	0	1.853	0	0	0	0	0	0
Nebraska	.115	0	3.927	0	0	604.00	0	604.00	604.00
N. Dakota	3.710	1.500	.530	0	0	0	0	0	0
Ohio	2.139	35.604	1.572	0	0	41.00	103.00	149.00	149.00
S. Dakota	5.065	0	2.190	0	0	0	15.00	15.00	15.00
Wisconsin	.115	33.250	2.130	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0	0
Total	19.707	76.210	207.695	0	27	869.75	11,083.00	11,957.75	11,957.75

a 20 gallons of this quantity furnished by State.

CHEMICALS, QUANTITIES USED, APRIL 1, 1918, TO JUNE 30, 1925

Table 16. Data showing, by States, quantities of chemicals used in the barberry eradication campaign from April 1, 1918, to June 30, 1925

State	Salt (Tons)			Sodium arsenite (gallons)			Kerosene (Gallons)				
	Furnished by--			Furnished by--			Furnished by--				
	Property owner	State agency	Conference: P. G. Rust:	U. S. D. A.	Total	Conference: P. G. Rust:	U. S. D. A.	Total	Owner	U. S. D. A.	Total
Colorado	0	0	0	3,710:	3,710:	0	0	0	0	30,000:	30,000
Illinois	.750	54,170:	31,000	231,328:	317,248:	0	77,000:	77,000:	0	124,000:	124,000
Indiana	.819	0	0	54,716:	55,535:	0	0	0	0	0	0
Iowa	38,443	0	19,898	43,374:	101,715:	0	0	0	382,750:	0	382,750
Michigan	.030	0	8,491	34,115:	42,636:	0	0	0	0	10,811,000:	10,811,000
Minnesota	.382	.833:	9,211	22,160:	32,586:	0	23,250:	23,250:	0	10,000:	10,000
Montana	.125	0	0	3,783:	3,903:	0	0	0	0	0	0
Nebraska	.128	0	8,550	15,217:	23,895:	0	0	0	604,000:	0	604,000
N. Dakota	9,270	5,000:	0	4,330:	13,600:	0	7,000:	7,000:	0	0	0
Ohio	2,390	42,133:	0	5,178:	49,701:	16,200	30,100:	46,300:	2,174,000:	1,039,000:	3,263,000
S. Dakota	13,835	0	17,850	2,190:	33,925:	0	0	0	0	15,000:	15,000
Wisconsin	.250	60,150:	70,000	25,050:	155,450:	403,000	190,000:	593,000:	a, 375:	0	375
Wyoming	0	0	0	.100:	.100:	0	0	0	0	0	0
Total	66,472	162,236:	165,000	445,251:	839,009:	424,200	327,350:	751,550:	3,161,125:	12,079,000:	15,240,125

a Carbon bisulphide.

b Drip oil.

c 1,939 gallons furnished by state.

GRAND SUMMARY, ORIGINAL BUSHES, SPROUTING BUSHES, AND SEEDLINGS, 1913 to 1925

Table 17. Data showing, by States, the number of bushes, sprouting bushes, and seedlings found and destroyed in all surveys in the barberry eradication campaign, April 1, 1913, to June 30, 1925

State	Original bushes		Sprouting bushes		Seedlings	
	Found	Destroyed	Found	Destroyed	Found	Destroyed
Colorado	24,403	24,396	6,811	6,810	2,535	2,535
Illinois	276,449	276,449	13,219	13,219	1,594,112	1,594,112
Indiana	195,989	195,084	19,522	19,217	11,497	11,497
Iowa	792,123	792,119	18,713	13,366	35,654	35,654
Michigan	468,673	445,432	2,902	2,902	1,390,409	1,390,409
Minnesota	734,499	734,499	47,601	47,601	45,500	45,500
Montana	10,220	10,206	5,036	5,036	1,722	1,722
Nebraska	94,354	94,354	15,524	15,521	9,897	9,897
North Dakota	22,161	22,161	1,204	1,204	157	157
Ohio	263,540	259,682	13,501	13,501	291,264	291,264
South Dakota	59,513	59,513	42,930	42,980	26,254	26,254
Wisconsin	5,373,945	2,564,036	37,859	37,552	1,222,376	1,164,630
Wyoming	4,142	3,968	379	321	52	52
Total	6,570,152	5,531,669	275,306	274,280	4,631,929	4,573,743

Grand total of bushes, sprouting bushes, and seedlings found ----- 11,277,387
Grand total of bushes, sprouting bushes, and seedlings destroyed ----- 10,679,692

SUMMARY OF THE COSTS OF OPERATING 40 GOVERNMENT-OWNED TRUCKS IN THE BARBERRY ERADICATION CAMPAIGN

Table 13.

(Dates of purchase approximately July 1, 1923.)
(Dates of disposal approximately May 1, 1925.)

State	Truck Number	Days of Service	Miles Traveled	Actual Depreciation	Cost of Operation and Depreciation	Cost per Mile for Operation and Depreciation	Cost per Mile for Depreciation	Cost per Mile for Operation	Cost per Gallon of Gasoline	Cost per Mile for Repairs	Cost per Mile for Oil
Ill.	819	302	19,422	\$247.50	\$965.68	227.09	\$.037	\$.049	\$.011	15.6	71.1
Ill.	820	345	22,274	260.00	932.97	176.34	.030	.041	.003	17.7	69.4
Ill.	843	259	17,445	260.00	598.74	297.00	.036	.051	.017	16.0	83.3
Ill.	844	251	15,507	255.00	831.58	216.42	.031	.044	.011	16.6	105.1
Ind.	821	294	15,535	305.00	1,010.78	125.34	.037	.054	.006	14.9	72.3
Ind.	822	311	16,363	320.00	1,030.86	162.29	.043	.062	.009	15.1	84.7
Ind.	841	298	16,992	255.00	999.36	163.40	.041	.053	.009	16.0	85.3
Ind.	842	269	15,537	305.00	1,016.65	194.36	.045	.065	.012	15.1	80.9
Iowa	824	327	22,650	394.00	1,179.42	199.86	.034	.052	.003	15.1	71.0
Iowa	826	332	20,992	374.00	1,072.63	97.53	.033	.051	.004	13.5	56.7
Mich.	709	433	15,506	233.00	992.33	110.03	.040	.052	.005	13.1	54.5
N. Dak.	703	235	19,690	261.12	1,119.39	99.75	.043	.056	.005	13.4	62.2
N. Dak.	830	241	16,277	261.12	1,121.32	169.42	.032	.063	.010	12.7	60.2
Ohio	816	359	23,019	235.00	1,256.05	292.16	.043	.055	.012	14.5	107.5
Ohio	848	320	22,014	255.00	1,121.32	249.60	.037	.050	.011	15.3	74.1
Ohio	849	230	15,751	255.00	1,035.70	247.55	.047	.065	.015	14.7	82.1
S. Dak.	832	260	24,123	302.56	1,293.75	197.45	.041	.053	.003	14.9	60.7
S. Dak.	840	231	17,572	277.56	903.45	76.05	.035	.051	.004	15.3	84.5
Wis.	703	298	20,199	279.00	926.90	127.42	.032	.045	.006	16.6	112.5
Wis.	836	240	16,935	269.00	739.22	51.56	.027	.043	.004	13.9	155.8
Total	8,935	333,003	20,463,633	511.17							
Average	296.7	19,150	237.34	1,024.13	175.55		.038	.053	.009	15.2	75.3

1 Includes cost of gasoline, oil, storage, towage, laundry, tires, tubes, and repairs.

ORGANIZATION AND PERSONNEL
July 1, 1925.

Administrative

Washington, D. C. Office of Cereal Investigations, Bureau of Plant Industry, U. S. Department of Agriculture. Associate pathologist in charge, Dr. F. E. Kempton; associate pathologist, Lynn D. Hutton.

Field Operations

Publicity. Cartoonist and illustrator, G. D. George, University Farm, St. Paul, Minn.; associate pathologist, Noel F. Thompson, cooperating with the Conference for the Prevention of Grain Rust, 300 Lewis Building, Minneapolis, Minn.

Investigations. Studies of barberry species and hybrids: Assistant horticulturist, B. Y. Morrison, Bell, Md.; agent, J. H. Craigie, University Farm, St. Paul, Minn.

Epidemiology studies: Collaborating agent, Dr. E. C. Stakman, University Farm, St. Paul, Minn.; assistant pathologist in charge, Edmund B. Lambert, University Farm, St. Paul, Minn., agents, Wallace Butler and Jonas J. Christensen.

Colorado: Department of Botany, Agricultural College, Fort Collins. State leader, Ernest A. Lungren; cooperating agent, Roud McCann, Director of Extension; collaborating pathologists, C. D. Learn and Dr. L. W. Durrell; State law-enforcement agent, Dr. C. P. Gillette, State Entomologist; stenographer-clerk, Miss Winifred Watson; field agents: Jesse A. DeFrance and Bruce J. Thornton.

Illinois: Post Office Building, Urbana. State leader, Gordon C. Curran; cooperating agent, H. W. Mumford, Director of Extension; collaborating pathologist, George H. Dungan; State law-enforcement agent, P. A. Glenn, Chief Inspector, State Department of Agriculture; agent, Miss Mary A. Hopkins; field agents:

Bills, Robert W.
Cornwell, Earl D.
Crabb, Jarred V.
Craigie, Lewis E.
Ellis, Charles G.
Fielder, Virgil B.
Fobes, Franklin E.
Frolik, Frank
Garrison, Earl R.
Gilbert, Wayne A.

Grumke, Edward C.
Hafenrichter, Atlee L.
Hardy, Max B.
Harmon, R. C.
Hayden, Lyle J.
Holt, Henry C.
Holt, Orval C.
Mathis, Alvin L.
Meyer, Walter M.
Moore, Clarence E.

Muncie, Wendell S.
Powell, Chester R.
Rawlings, Cecil O.
Richardson, John L.
Seward, John H.
Smith, Norman J.
Solheim, Wilhelm G.
Stark, Orton K.
Turner, Lewis M.
Uhlin, Bernard W.
Walters, John C.

Indiana: Botany Department, Purdue University Agricultural Experiment Station, La Fayette. State leader, Wayne E. Leer; cooperating agent, G. I. Christie, Director of Extension; collaborating pathologists, Dr. H. S. Jackson and Dr. E. B. Mains; State law-enforcement agent, Frank N. Wallace, State Entomologist, Indianapolis; stenographer-clerk, Miss Josephine M. Waldron; field agents:

Braybrook, Laurence L.	Fosbrink, Roy L.	Libbert, Clarence B.
Castell, Stanley	Hazel, Edward E.	McCally, Ross L.
Cross, Walter M.	Maggart, Ralph J.	Scearce, Charles G.
Dougherty, Lawrence A.	Miller, Charles H.	Sewell, Gerald S.
Eliason, Everett J.	Palmer, C. Mervin	Zumstein, Reginald B.

Iowa: Botany Department, Iowa Agricultural Experiment Station, Ames. State leader, Marion A. Smith; cooperating agents, R. K. Bliss, Director of Extension, M. H. Burns, Extension Plant Pathologist, N. R. Carmichael, Graceland College, Lamoni, Ia; State law-enforcement agent, Dr. C. J. Drake, State Entomologist; collaborating pathologists, Dr. I. E. Melhus, Station Plant Pathologist, and Dr. S. M. Dietz, assistant pathologist, Office of Cereal Investigations; stenographer-clerk, Miss Frances M. Hanson; field agents:

Border, Nile M.	Inman, Forrest G.	Morris, Le Ross
Dunn, Stuart J.	Leach, Lyle D.	Raleigh, Walter P.
Earhart, Harry C.	Mefferd, Guy A.	Steddom, John M.
Erwin, Lester E.	Mendell, Frank H.	Thompson, James W.
Herriott, Cleon E.	Morling, Edgar S.	Walter, Paul M.
		Zimmerman, Byron B.

Michigan: Agricultural College, East Lansing. State leader, Walter F. Reddy; cooperating agent, R. L. Baldwin, Director of Extension; State law-enforcement agent, L. R. Taft, State Inspector of Nurseries; stenographer-clerk, Miss Bernice L. Waterman; field agents:

Boyd, James L.	Kuhn, George W.	Salisbury, Chester F.
Braamse, Byron L.	Kurtz, Lloyd B.	Schickler, Clyde K.
Braamse, Leonard J.	Lakin, Harold D.	Schwartz, George T.
Cash, Justin C.	Landsburg, Kenneth G.	Smith, Paul M.
Dobben, Ben J.	Lenz, Carl H.	Smith, Roscoe G.
Drew, Kenneth L.	Lewis, James A.	Teeter, Lowell E.
Edmunds, Allen T.	Loret, Ernest L.	Tillotson, Ivan G.
Francis, Milton J.	McIntyre, Charles W.	Van Buren, Earl C.
Hackett, Paul M.	Markle, Edmund F.	Vaughan, Sylvester M.
Horwood, Russell E.	Mason, Elwood W.	Warner, Robert E.
Hultman, Vivian J.	Moore, Lucius H.	Watson, Elba E.
Humeston, Fred R.	O'Connor, Jack W.	Werner, Elwyn A.
Jaggers, Francis A.	Ross, Francis W.	Wiernan, Leslie B.
Kidman, James L.	Rozell, Andrew M.	Wilt, Clay E.
	Rummel, Martin F.	

Minnesota: University Farm, St. Paul. State leader, Leonard W. Melander; cooperating agent, F. W. Peck, Director of Extension; collaborating pathologists, Dr. E. M. Freeman and Dr. E. C. Stakman; State law-enforcement agent, A. G. Ruggles, State Entomologist; stenographer-clerk, Miss Helen W. Barrett; field agents:

Aarke, Einar G.	Gustafson, Carl B.	Peterson, Arthur G.
Allison, Clyde C.	Holloway, James K.	Peterson, Vincent F.
Austvold, Edwin	Kelso, Maurice M.	Powers, Francis B.
Baker, Henry H.	Kunkel, Paul W.	Ryan, John F.
Christgau, Rufus J.	Lefebvre, Camille L.	Schaal, Lawrence A.
Dawley, J. Murdoch	Morris, Harold P.	Schaub, Benjamin H.
Elling, William J.	Oleson, Homer C.	Wallace, James M.
Franze, Fritz G.	Ostrom, Emil H.	

Montana: State College of Agriculture, Bozeman. State leader, W. L. Popham; cooperating agent, J. C. Taylor, Director of Extension; agent, H. E. Morris; State law-enforcement agent, W. L. Shovell, Horticultural Inspector; laboratory assistant, Miss Ruth Swingle; stenographer-clerk, Miss Marguerite Marquis; field agents:

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Donohoe, Heber C.	Kerlee, A. LeRoy	Ross, Richard C.
Forbes, Jacob W.	Lillard, John J.	Sales, Walter L.
Fox, David E.	Long, Fred E.	Swan, Leonard R.
Freeman, Monroe E.	McIver, Kenneth B.	Wisner, Frank B.
	Neill, Frank D.	

Nebraska: College of Agriculture, University Farm, Lincoln. State leader, Albert F. Thiel; collaborating agent, W. H. Brokaw, Director of Extension; collaborating pathologist and law-enforcement agent, Dr. G. L. Peltier; stenographer-clerk, Mrs. Burnetta R. Walroth; field agents:

Claassen, Theodore	Gardner, John D.	Kiltz, Burton F.
Davis, Clyde L.	Harris, Harvey B.	Rohrbaugh, Percy W.
Dittus, Benjamin F.	Hunt, Burt W.	Scrivner, Forrest J.

North Dakota: Agricultural Experiment Station, Agricultural College, P. O. State leader, George C. Mayoue; cooperating agent, G. W. Randlett, Director of Extension; collaborating pathologist, H. L. Bolley; State law-enforcement agent, Joseph A. Kitchen, Commissioner of Agriculture; stenographer-clerk, furnished by the State; field agents:

Anderson, Martin C.	Herbison, Herbert W.	Severson, Albert S.
Archer, Verne R.	Horne, James	Severson, L. N.
Arnold, Cyril H.	Jensen, Clarence L.	Sondreaal, Gilmore E.
Baden, Carl H.	Johnson, Leon M.	Trowbridge, Vernon H.
Baillie, Alden M.	Knight, Allen J.	Trumbull, Francis W.
Bairey, George B.	Miller, Claude L.	Welsh, Maurice J.
Blake, Miss Charlotte E.	Narum, Leslie F.	Yocum, Edward M.
Hendrickson, Earl A.	Rumpeltes, Ben J.	

Ohio: Botany Department, Ohio State University, Columbus, Ohio. State leader, John W. Baringer; cooperating agent, George B. Crane, Director of Extension; collaborating pathologist, W. G. Stover; State law-enforcement agent, Richard Faxon, Chief of the Division of Plant Industry; stenographer-clerk, Mrs. M. E. Joice; field agents:

Atwood, Harry	Isler, David A.	Runnels, Harmon A.
Bangham, Ralph V.	Jackson, Earl K.	Sampson, H. C.
Beck, Byron B.	Jones, Thomas H.	Setterfield, Hugh E.
Buckman, Marcus E.	Kent, Malcolm F.	Shackson, Lee
Christy, Donald F.	Lafferty, Halsey F.	Smith, Warren L.
Cowdrey, G. C.	Leavengood, Joseph D.	Snider, Perry E.
Davis, John A.	Lemasters, Houston M.	Swartz, Delbert
Diller, Jesse D.	Lichti, Ralph H.	Tozzer, Charles W.
Gilmore, R. Clark	Minneman, Paul G.	Violet, Charles O.
Hambleton, Edson J.	Rowalt, Elmer M.	

South Dakota: College of Agriculture, Brookings. State leader, Raymond O. Bulger; cooperating agent, C. Larsen, Director of Extension; collaborators, Dr. A. N. Hume and Dr. A. T. Evans; State law-enforcement agent, H. C. Severin, State Entomologist; stenographer-clerk, Miss Dorothy E. Bossert; field agents:

Caldwell, Ralph M.	Kurtz, William A.	Sayre, Lawrence C.
Eberlein, Louis A.	Larson, Courtney W.	Starr, G. Herman
Errington, Paul L.	Locke, Rush B.	Walter, Glenn L.
Fairchild, Jasper S.	Michaels, Walter H.	Welch, Earl I.
Hume, A. T.	Murray, Joe F.	Welch, Frank F.
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State agents cooperating:

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Bain, Frank C.	McCrea, Forrest D.	Seymour, Walter J.
Cheney, Lellen S.	Nightingale, Gordon T.	Stevens, Harry
Craig, John E.	Otterson, Henry	Stiles, Hugh R.
Damsheuser, C. W.	Owen, Forrest V.	Stinchfield, R. H.
Flueck, Herbert A.	Parmelee, Harris B.	Tegge, Charles W.
Harrington, John T.	Pelton, J. LeRoy	Webb, Julian H.
Harrison, Carter M.	Peterson, Lester C.	Whitehead, Lyndell P.
Kline, Homer V.	Rowland, Raymond E.	Zaunmeyer, William J.
Knutson, Arthur M.	Schraedl, William S.	

Wyoming: College of Agriculture, University of Wyoming, Laramie. State leader, Ralph U. Cotter; cooperating agent, A. E. Bowman, Director of Extension; State law-enforcement agent, A. D. Faville, President, State Board of Horticulture; stenographer-clerk, furnished by State.

